

WHAT IS CLAIMED IS:

1 1. Thermal insulation for an underwater component comprising,
2 a heat-insulating molding surrounding the component and a resilient water-resistant
3 envelope surrounding the heat-insulating molding, wherein the heat-insulating
4 molding is a nanoporous, mesoporous or microporous material based on precipitated
5 or pyrogenic silica, arc silica and/or aerogel.

1 2. The heat insulation of claim 1, wherein the microporous
2 insulation material is present encased within a sheet.

1 3. The heat insulation of claim 2, wherein the sheet is a single-
2 ply sheet such as, for example, a polyethylene (PE) sheet or a polyamide (PA) sheet
3 or a multiply sheet (laminated sheet), such as, for example, a PE/PA sheet or a
4 PE/PA/polypropylene sheet.

1 4. The heat insulation material of claim 3 wherein said single-ply
2 sheet comprises polyethylene or polyamide.

1 5. The heat insulation of claim 3, wherein said multi-ply sheet
2 comprises polyethylene/polyamide or polyethylene/polyamide/polypropylene.

1 6. The heat insulation of claim 2, wherein the sheet exhibits
2 reduced permeability to fluids and is metallized or contains a metal layer to reduce
3 permeability.

1 7. The heat insulation of claim 2, wherein the interior of the
2 sheet is evacuated.

3 8. The heat insulation of claim 1, wherein the resilient water-
4 resistant envelope is a material having an elongation at break of from 100 to
5 1,000%.

1 9. The heat insulation of claim 1, wherein the resilient water-
2 resistant envelope is an elastomer or a resilient thermoplastic.

1 10. A method for the thermal insulation of an underwater
2 component in oil and gas production, comprising surrounding the underwater
3 component by a microporous material and is providing a resilient, water-resistant
4 envelope, around said microporous material.

1 11. A thermally insulated underwater component, prepared by the
2 method of claim 10.

1 12. The thermally insulated component of claim 11, wherein said
2 microporous material is encased within a polymer sheath, said microporous material
3 having a plurality of incisions therein which render it flexible and conformable to
4 said underwater component.

1 13. The thermally insulated component of claim 12, wherein said
2 microporous material comprises pyrogenic silica.

1 14. The thermally insulated component of claim 10, wherein no
2 protective steel sheath surrounds said resilient water-resistant envelope.

1 15. The thermally insulated component of claim 10, wherein said
2 microporous material has a density at 300 bar pressure of about 1,000 Kg/m³ and
3 a thermal conductivity of about 0.06 W/mK or less.